that the invention can be practiced with modification within the spirit and scope of the claims.

What is claimed is:

1. A method of assembling a gas turbine engine assembly, said method comprising:

providing a core gas turbine engine including a high-pressure compressor, a combustor, and a turbine;

coupling a low-pressure turbine axially aft of the core gas turbine engine;

coupling a fan assembly axially forward of the core gas turbine engine; and

coupling a booster compressor to the low-pressure turbine; and coupling the fan assembly to the booster compressor via a gearbox and a drive shaft such that, upon rotation of the drive shaft in a first rotational direction, the booster compressor and the low-pressure turbine rotate in the first rotational direction at a first rotational speed and the fan assembly rotates in a second rotational direction at a second rotational speed, the first rotational direction different than the second rotational direction, the first rotational speed greater than the second rotational speed.

2. A method in accordance with claim **1** further comprising:

wherein coupling the fan assembly to the booster compressor via a gearbox comprises coupling the gearbox between the driveshaft and the fan assembly.

3. A method in accordance with claim **2** further comprising coupling a first thrust bearing assembly between the drive shaft and the gearbox such that thrust loads generated by the low-pressure turbine and the booster compressor are transferred to ground.

4. A method in accordance with claim **2** further comprising coupling a second thrust bearing assembly between the gearbox and the fan assembly such that thrust loads generated by the fan assembly are transferred to ground.

5. A method in accordance with claim **2** wherein coupling a gearbox further comprises providing the gearbox with a substantially toroidal cross-sectional profile between the fan assembly and the drive shaft such that the gearbox substantially circumscribes the drive shaft.

6. A method in accordance with claim **1** further comprising:

coupling a gearbox to the fan assembly; and

coupling a flex connection between the drive shaft and the gearbox.

7. A method in accordance with claim **1** wherein coupling a booster compressor to the low-pressure turbine further comprises coupling the booster compressor to the low-pressure turbine with the booster compressor including a predetermined quantity of compressor stages that is based on a compression ratio of the fan assembly and an overall compression ratio of the gas turbine engine assembly.

8. A method in accordance with claim **1** wherein coupling a booster compressor to the low-pressure turbine further comprises providing the booster compressor with less than four booster stages.

9. A turbine engine assembly comprising:

a core gas turbine engine comprising a high-pressure compressor, a combustor, and a high-pressure turbine;

a low-pressure turbine coupled axially aft of said core gas turbine engine;

a fan assembly coupled axially forward of said core gas turbine engine; and

a booster compressor coupled to said low-pressure turbine; and a fan assembly coupled to a booster compressor via a gearbox and drive shaft such that, upon rotation of said drive shaft in a first rotational direction, said booster compressor and said low-pressure turbine rotate in the first rotational direction at a first rotational speed and said fan assembly rotates in a second rotational direction at a second rotational speed, the first rotational direction different than the second rotational direction, the first rotational speed greater than the second rotational speed.

10. A turbine engine assembly in accordance with claim **9** wherein said gearbox is coupled between

said drive shaft and said fan assembly.

11. A turbine engine assembly in accordance with claim **10** further comprising a first thrust bearing assembly coupled between said drive shaft and said gearbox and configured to transfer thrust loads generated by said low-pressure turbine and said booster compressor to ground.

12. A turbine engine assembly in accordance with claim **10** further comprising a second thrust bearing assembly coupled between said gearbox and said fan assembly and configured to transfer thrust loads generated by said fan assembly to ground.

13. A turbine engine assembly in accordance with claim **10** wherein said gearbox has a substantially toroidal cross-sectional profile and substantially circumscribes said drive shaft.

14. A turbine engine assembly in accordance with claim **10** further comprising a frame configured to support said fan assembly and said gearbox, said frame configured to carry said fan assembly radial, thrust, and overturning moment to an outer engine structure and mounts.

15. A turbine engine assembly in accordance with claim **9** further comprising:

a flex connection coupled between said drive shaft and said gearbox.

16. A turbine engine assembly in accordance with claim **9** wherein said booster compressor comprises a predetermined quantity of compressor stages that is based on a compression ratio of said fan assembly and an overall compression ratio of said gas turbine engine assembly.

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